

Synthesis

- $K + Br_2 \rightarrow$
- $H_2 + Cl_2 \rightarrow$
- $Ca + Cl_2 \rightarrow$
- $Li + O_2 \rightarrow$
- $Fe + O_2 \rightarrow$
(two different synthesis reactions)
- $V + O_2 \rightarrow$
(four different synthesis reactions)
- $Co + O_2 \rightarrow$
(two different synthesis reactions)
- $Ti + O_2 \rightarrow$
(three different synthesis reactions)
- $K_2O + H_2O \rightarrow$
- $MgO + H_2O \rightarrow$
- $SO_2 + H_2O \rightarrow$
- $NO_2 + H_2O \rightarrow$
- Ammonia gas and hydrogen chloride gas react to form a solid compound. Predict what the solid compound is. Then write a balanced chemical equation.

Decomposition

- $HI \rightarrow$
- $Ag_2O \rightarrow$
- $AlCl_3 \rightarrow$
- $MgO \rightarrow$
- $MgCO_3 \rightarrow$
- $CaCO_3 \rightarrow$
- $CuCO_3 \rightarrow$
- Mercury (II) oxide is a bright red powder. It decomposes on heating. What are the products of this decomposition? Write a balanced chemical reaction.

Single Displacement ** use the activity series

- $Ca + H_2O \rightarrow$
- $Zn + Pb(NO_3)_2 \rightarrow$
- $Al + HCl \rightarrow$
- $Cu + AgNO_3 \rightarrow$
- $Pb + H_2SO_4 \rightarrow$
- $Mg + Pt(OH)_4 \rightarrow$
- $Ba + FeCl_2 \rightarrow$
- $Fe + Co(ClO_3)_2 \rightarrow$
- $Cu + MgSO_4 \rightarrow$
- $Zn + FeCl_2 \rightarrow$
- $K + H_2O \rightarrow$
- $Al + H_2SO_4 \rightarrow$
- $Fe + Al_2(SO_4)_3 \rightarrow$
- $Ni + NiCl_2 \rightarrow$
- $Zn + H_2SO_4 \rightarrow$
- $Mg + SnCl_2 \rightarrow$
- $Br_2 + KCl \rightarrow$
- $Cl_2 + NaI \rightarrow$
- $Pb + HCl \rightarrow$
- $KI + Br_2 \rightarrow$
- $KF + Cl_2 \rightarrow$
- $Ca + H_2O \rightarrow$
- $MgSO_4 + Zn \rightarrow$
- $Ni + H_2SO_4 \rightarrow$

Double Displacement ** use solubility rules & indicate state of products

- $Pb(NO_3)_{2(aq)} + KI_{(aq)} \rightarrow$
- $FeCl_{3(aq)} + Na_2SO_{4(aq)} \rightarrow$
- $NaNO_{3(aq)} + MgSO_{4(aq)} \rightarrow$
- $Ba(NO_3)_{2(aq)} + MgSO_{4(aq)} \rightarrow$
- $HCl_{(aq)} + LiOH_{(aq)} \rightarrow$
- $HClO_{4(aq)} + Ca(OH)_{2(aq)} \rightarrow$
- $H_2SO_{4(aq)} + NaOH_{(aq)} \rightarrow$
- $BaCl_{2(aq)} + Na_2CrO_{4(aq)} \rightarrow$
- $H_3PO_{4(aq)} + NaOH_{(aq)} \rightarrow$
- $K_2CO_{3(aq)} + HNO_{3(aq)} \rightarrow$
- When sodium sulphite is mixed with hydrochloric acid, the odour of sulphur dioxide gas is detected. Write the balanced chemical equation.
- Hydrogen sulphide is a poisonous gas that has the odour of rotten eggs. When aqueous calcium sulphide is reacted with sulphuric acid, a rotten egg smell is detected. Write the balanced chemical equation.

Combustion - Write the balanced equation for the (i) complete combustion and (ii) incomplete combustion of:

- Methanol, CH_3OH , the fuel of alcohol lamps.
- Octane, C_8H_{18} , present in gasoline.
- Acetone, C_3H_6O , present in nail polish remover.
- Kerosene, $C_{16}H_{34}$, jet and rocket fuel.
- Butane, C_4H_{10} , fuel used in pocket lighters.
- Ethanol, C_2H_6 , found in alcoholic beverages.
- Propane, C_3H_8 , fuel used to power BBQ s.